

# Pressure Ulcer Prevention With Application of Silicone Foam Dressing in Intensive Care Unit: A Systematic Review

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**Abstract:** Pressure ulcers pose a significant burden to patients in intensive care units. The increasing number of studies that have examined the use of foam dressings, and their ability to protect the skin from damage with shear and friction redistribute pressure. The Systematic review has the purpose to know the use of silicone foam dressing to prevent pressure ulcers. Information related to this research was found in some databases such as MEDLINE journals, PubMed, CINAHL, Ebsco, Elsevier ScienceDirect identified that was started from 2012 until 2017. The result of a review journal Articles 20 indicate that the use of silicone foam dressings can prevent pressure ulcers to clients in intensive care units. Sufficient appropriate knowledge and skills about healthcare products and procedures for the prevention and treatment of pressure ulcers are needed to reduce the incidence of pressure ulcers. Financial analysis shows that the use of silicone foam dressings can reduce the healthcare cost. Current research suggests that while further research is required, the use of silicone foam dressings have a place alongside standard procedures, in helping to prevent pressure ulcers, shear and friction damage in intensive care units.

## 1 BACKGROUND

Patients in critical condition require bed rest in a long time. Patients usually can't move in a supine position. Critical patient at risk of injury to the skin because of their sheer and friction caused by pressure or pressure combined with the movement of the bony area commonly referred to as pressure sores or *pressure* ulcers.

The incidence of hospital-acquired pressure ulcers (Clear) according to the National Pressure Ulcer Advisory Panel (NPUAP) in 2000 to 2010 the incidence in Intensive Care Unit (ICU) stays high of 5.2% to 41%, the incidence rate may vary the number of patients examined the type of ICU, risk assessment and research methods (Kalowes, Messina and Li, 2016).

A pressure ulcer is a localized damage to the skin and underlying soft tissue or bony part relates to medical devices or other devices. Injuries can include intact skin or open wounds and may hurt. Injuries caused by strong pressure and pressure or prolonged pressure in the patient's condition can not

move. Soft tissue tolerance to pressure and movement is influenced by the microclimate, nutrition, perfusion, comorbid conditions, and soft-tissue conditions (Edsberg *et al.*, 2016). Risk factors or contributing factor associated with the *pressure* ulcer; the implications of these factors has not been described yet (European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel, 2014).

Prevention of pressure ulcers is important because of pressure ulcers are preventable. The purpose prevention of pressure ulcer is to reduce the time and/or the amount of pressure and rips that are influenced by the equipment is effective or not, and the methods used. Prevention of pressure sores in patients who are at risk should be conducted on an ongoing basis for those at risk of pressure sores (Edsberg *et al.*, 2016). Although the standard strategies such as risk assessment, regular repositioning, and advocates the use of the surface have been carried out in the hospital, the problem of pressure sores remains a challenge, especially in patients who are treated in the ICU. A variety of factors including the severity of the illness client,

elongation length of stay, and there are many immobilization causes of pressure ulcer incidence rate (N. Santamaria *et al.*, 2015).

The purpose of this systematic review was to describe the effectiveness of the use of silicone foam dressing to prevent pressure ulcers in patients treated in intensive care.

## 2 METHODS

This study was a systematic review of research journal articles prepared Randomized Control Trial (RCT), and expanded with non RCT research because of the limitations of the journal on the topic.

Inclusion criteria for this study are the prevention of pressure sores using silicone foam dressing, while exclusion criteria are the absence of full text in pdf format, in addition, some of the literature shows provide interventions other than silicone foam dressing.

The database used in the literature search was Scopus, Proquest, ScienceDirect, BMC, EBSCOhost, PubMed by limiting keyword "Pressure Ulcer" AND "dressing", year published between 2012-2017.

To determine the quality of the articles used in this systematic review of research using PRISMA 2009 Critical Appraisal Checklist accessed from [prisma-statement.org](http://prisma-statement.org).

Data Extraction designed using criteria taken the main component is the goal, the design of the study population (sample size, characteristics, and methods of recruitment), the intervention of the use of silicone foam dressing, the outcome measures, the method of data collection, and analysis of results. Then, articles meeting the criteria related to the quality and validity were evaluated with a focus on the sample size, allocation of clients and their needs and the bias factor.

The data described in the narrative. Presentation of data includes the characteristics of the article, the effectiveness of interventions, and outcomes after implementation of the intervention.

## 3 RESULTS

The article that found as many as 20 research journals published from 2013 up to 2017. The research conducted in various countries with diverse methods. The research method was found in the

study of Randomized Controlled Trial and non-Randomized Controlled Trial.

A non-randomised experimental study in an acute medical ward with participants who presented at the Emergency Department (ED), with the aim of examining the effectiveness of a foam dressing in reducing the prevalence of sacral PU. Fifty-one participants aged over 65 and assessed to be at high/very high risk of developing a PU based on the Waterlow Risk Assessment Tool (2005) were included (Cubit, McNally and Lopez, 2013).

A randomised controlled trial, to investigate the effectiveness of a Mepilex Border Sacrum or Mepilex Heel dressing in preventing PUs in a hospital ICU after being applied in the ED. The results revealed that there were significantly fewer patients with PUs in the intervention group compared to the control group (5 versus 20) (Nick Santamaria *et al.*, 2015).

Use of a soft silicone foam dressing combined with preventive care yielded a statistically and clinically significant benefit in reducing the incidence rate and severity of HAPUs in intensive care patients. This novel, cost-effective method can reduce HAPU incidence in critically ill patients (Kalowes, Messina and Li, 2016).

Previous study applied the silicone border foam dressing to 69 patients admitted to ICU who had no sacral PU on admission (Walsh *et al.*, 2012). The intervention was discontinued prematurely in 7 patients, including 5 who expired during their ICU stay, 1 who was agitated resulting in friction against the dressing and frequent displacement, and 1 who did not fulfill inclusion criteria after the dressing was initially applied. Data collection continued for 3 months. The silicone foam sacral dressing was applied to the sacral area and maintained through the patients' ICU stay. The dressing was changed every 3 days to allow for assessment of the sacral area based on 2007 NPUAP PU staging guidelines. As the result, 53 ICU patients developed pressure ulcers in the sacral area in fiscal year 2009, representing a 12.5% incidence for the ICU as compared to a 3.4% overall pressure ulcer incidence for the total hospita (Walsh *et al.*, 2012).

Park (2014) measured the effect of a silicone border foam dressing on the development of pressure ulcers (PUs) and incontinence-associated dermatitis in intensive care unit (ICU) patients. The application of a silicone border foam dressing decreased PU development and reduced the IADS score. Pressure ulcer development was found to be related to IADS score; the incidence of PU

development significantly increased as IADS score increased.

All the research result show that use of silicone foam dressing gave positive effect to prevent the pressure ulcer for patients in Intensive care unit. It

can be considered to use this protocol to diminish patient's burden by pressure ulcer because it can reduce the health care cost and risk for infection that potentially cause sepsis that harm for patient.

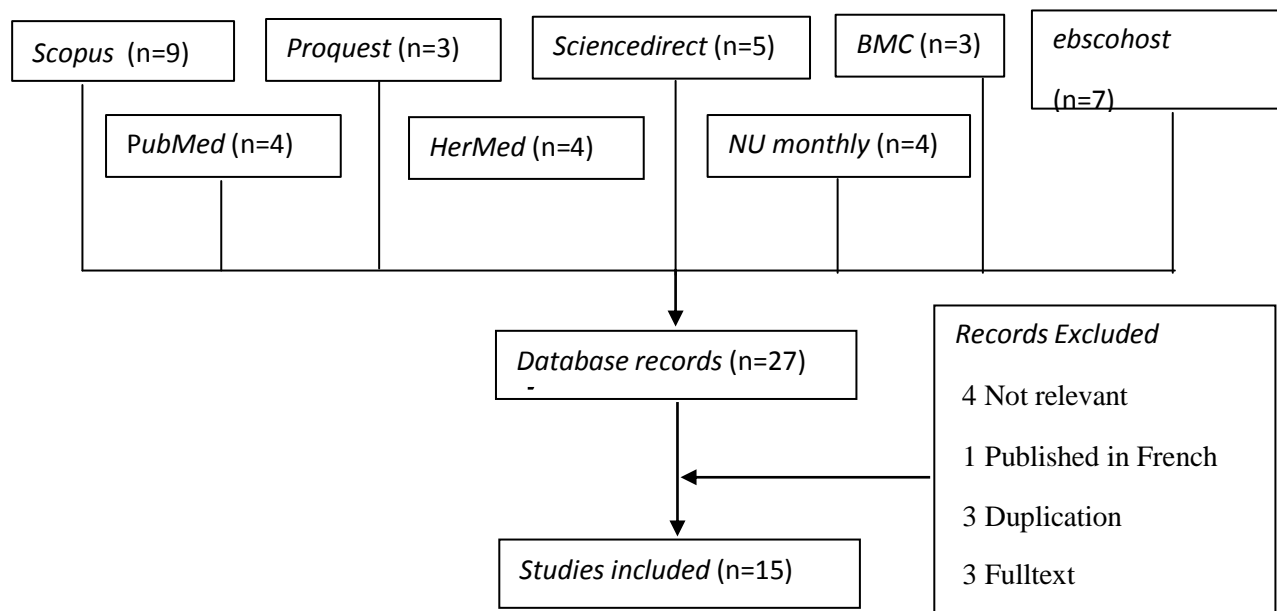


Figure 1. Paper Selection Process

## 4 DISCUSSION

Pressure ulcer is a problem that may be acquired clients of hospitalization. The conditions resulted in losses for its clients. The increasing cost of care to be one of the negative impacts of the occurrence of pressure sores.

Nick Santamaria et al., 2015 conducted a randomized controlled trial to investigate the effectiveness of Border Sacrum Mepilex or Mepilex Heel in preventing PU in ICU hospital after being applied in the ED. Hypothesis Santamaria and his research team are that patients treated with the dressing will reduce PU incidence rate compared with patients who received standard care. A total of 440 participants were randomized to a control group (n = 221), which receives regular PU prevention strategies, or the intervention group (n = 219), which receives regular PU prevention strategies, plus the application of the Mepilex dressing to the sacrum or heel. The results showed that significantly fewer patients with PU in the intervention group compared with the control group (5 to 20).

Kalowes et al., 2016 found that the use of silicone-coated foam dressing as much as 5 layers further reduce the formation of HAPUs when the dressing is applied within 24 hours after admission to the ICU. These results are similar to studies conducted Santamaria et al when placing the dressing on the sacrum/heel when the patient is in the emergency department. However, not all patients in the ICU through emergency departments, some of which are the direct reception and some transfers to the ICU from another room in the hospital. Participants in this RCT acute risk of skin damage; However, the use of preventive dressing reduce the pressure on high-risk patients as well (Park, 2014).

As a result of Kalowes et al research findings, the system 5-our hospital now has mandated the use of foam Sacep Mepilex Border Sacrum for the prevention of all patients who are at high risk for ulceration pressure in all areas of care, including space procedural and operations (Kalowes, Messina and Li, 2016).

In another study, N. Santamaria et al.(2015) the study provides evidence of the benefits of the cost to implement the Border Sacrum Mepilex and Mepilex Heel dressing on the sacrum and heels of critically ill

patients when they arrive at the ED. Dressing intervention costs and the time required for dressing application can easily offset by the savings gained great care through the reduction of PU in ICU. Implications proved policy changes. Policymakers in hospitals should consider the use of dressing prophylaxis among high-risk patients with ED or ICU when developing clinical protocols and new initiatives for the PU (Mallah, Nassar and Kurdahi Badr, 2015)

The analysis in terms of financing, a study showed that the use of silicone foam dressing can be more efficient and does not burden the patient. The use of silicone foam is also cheaper when compared with other types of dressings (Nick Santamaria *et al.*, 2015). Efforts need to be engaged to prevent the occurrence of lesions of this nature and, given the inevitability of the occurrence of a PU, immediate action in order to prevent its progression is essential, as the stage advances the higher are the costs related to the treatment and management of associated complications (European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel, 2014; Fernandes *et al.*, 2015). Good adhesion and factors that influence it are important aspects to be considered by nurses at the time of recommendation and selection of the type of dressing for prevention of sacral PU (Inoue *et al.*, 2016)

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## 5 CONCLUSION

Some research findings indicate that the use of silicone-coated foam is effective in the prevention of pressure sores. Surely it would benefit the client. From the financial side also found that the use of these dressings cheaper than other dressings. The implication, further research is needed to be related to their effectiveness in preventing the occurrence of pressure sores in patients admitted to the ICU with a high risk of pressure sores in the area of bony prominences.

The use of *dressing* silicone foam is also more efficient in terms of financing when compared with other dressings. The use of silicone foam dressings may be used in the ICU for prevention of pressure sores. As for the availability of nurses related to modifications to the materials with the same characteristics. So as to improve the quality of service to clients.

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